

WHAT IS CLAIMED IS:

1. A chamber housing enclosing a plasma region in a large area
5 plasma source used for performing plasma assisted processes on large area
substrates, said chamber housing comprising:
a housing member constituting a substantially vertically extending wall
surrounding a space corresponding to the plasma region, said housing member
having a plurality of openings, and electrically conductive elements forming an
10 electrostatic shield around the space;
a plurality of dielectric members each having a peripheral edge and
each disposed to close a respective opening; and
sealing means forming a hermetic seal between said housing member
and said peripheral edge of each of said dielectric members.
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2. The chamber housing according to claim 1 wherein said
housing member has a plurality of recesses, each of said openings is formed in
a respective recess, and said sealing means are disposed between said
peripheral edge of each of said dielectric members and said recesses.
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3. The chamber housing according to claim 2 wherein said wall
has a polygonal form with a plurality of flat sides.
4. The chamber housing according to claim 3 wherein each of said
25 sides has a single opening.
5. The chamber housing according to claim 4 wherein said
electrically conductive elements are metal bars extending between, and
secured to, upper and lower edges of said wall, each of said metal bars
30 extending across a respective opening.

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6. The chamber housing according to claim 5 further comprising elastic members interposed between said metal bars and said dielectric members.

5 7. The chamber housing according to claim 3 wherein each of said sides has a plurality of openings.

8. The chamber housing according to claim 7 wherein said electrically conductive elements are constituted by portions of said wall that
10 extend between top and bottom edges of said wall and are interposed between said openings.

9. The chamber housing according to claim 8 wherein each of said dielectric members has a projecting portion that extends into said opening.
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10. The chamber housing according to claim 3 wherein said flat sides extend vertically.

11. The chamber housing according to claim 3 wherein said wall
20 has the form of a pyramidal frustum.

12. The chamber housing according to claim 2 wherein: said sealing means comprise, for each of said dielectric members, two annular seats disposed at an interface between said dielectric member and its associated
25 recess, said seals being spaced apart along the interface; said wall has a passage having a first end in communication with the interface and a second end remote from the interface; and said housing further comprises pressure monitoring means connected to said second end of said passage to monitor leakage of fluid past either one of said seals.

13. A large area plasma source used for performing plasma assisted processes on large area substrates in a plasma region, said source comprising:
- the chamber housing according to claim 1;
 - a coil surrounding said housing and operative for generating an
 - 5 RF field in the plasma region;
 - an enclosure member surrounding said housing and the plasma region;
 - gas injection means extending through said enclosure member for introducing an ionizable processing gas into the plasma region;
 - 10 substrate support means for supporting a substrate to be processed in the plasma region; and
 - a least one pump disposed for pumping gas out of the plasma region to maintain a low pressure in the plasma region.
14. The plasma source according to claim 13 wherein said gas injection means comprise at least one gas injection tube having at least one inlet portion for receiving a supply of the ionizable processing gas and an outlet portion provided with a plurality of injection nozzles via which the ionizable processing gas is conveyed from said inlet portion to the plasma
- 20 region, wherein said outlet portion extends parallel to a substrate supported on said substrate support means.
15. The plasma source according to claim 14 wherein said at least one gas injection tube has two inlet portions and said outlet portion is
- 25 interposed between said two inlet portions.
16. The plasma source according to claim 15 wherein said outlet portion of said at least one gas injection tube extends in a straight line between said two inlet portions.



17. The plasma source according to claim 16 wherein said at least one gas injection tube comprises a plurality of gas injection tubes spaced from one another in a plane parallel to a substrate supported on said substrate support means.